

Listing of Claims:

1. (Previously presented) A method of forming a conductive pattern in a mold layer, the method comprising:

forming an intaglio pattern in a mold layer;

forming a barrier layer on an upper surface of the mold layer and in the intaglio pattern;

forming a flowable material on the barrier layer;

removing a portion of the flowable material and a portion of the barrier layer outside the intaglio pattern to expose an upper surface of an oxide layer included in the mold layer and avoiding removing a portion of the flowable material and a portion of the barrier layer inside the intaglio pattern;

removing the portion of the flowable material from inside the intaglio pattern;

forming a conductive layer on the portion of the barrier layer inside the intaglio pattern and on the upper surface wherein the conductive layer comes in contact with the barrier layer and the upper surface; and

removing the conductive layer from the upper surface.

2. (Previously presented) A method according to Claim 1 wherein the barrier layer comprises a first barrier layer, the flowable material comprises a first flowable material, the mold layer comprises a first mold layer, the intaglio pattern comprises a contact hole in the first mold layer, and the conductive layer comprises a first conductive layer, the method further comprising:

forming a groove in a second mold layer on the first mold layer, the groove being disposed above the first conductive layer in the contact hole;

forming a second barrier layer on an upper surface of the second mold layer and in the groove;

forming a second flowable material on the second barrier layer;

removing a portion of the second flowable material and a portion of the second barrier layer outside the groove and avoiding removing a portion of the flowable material and a portion of the second barrier layer inside the groove;

removing the portion of the second flowable material from inside the groove;

forming a second conductive layer on the second barrier layer; and
removing a portion of the second conductive layer from outside groove and
avoiding removing a portion of the second conductive layer inside the groove.

3. (Original) A method according to Claim 1 wherein the intaglio pattern is formed by:

forming a contact hole in the mold layer; and
forming a groove in the mold layer above on the contact hole.

4. (Original) A method according to Claim 3 wherein forming the conductive layer comprises forming the conductive layer in the contact hole and in the groove.

5. (Original) A method according to Claim 3 wherein forming the contact hole and forming the groove comprises:

sequentially forming a first interlayer dielectric and a second interlayer dielectric on a substrate;

patterning the second interlayer dielectric to form a groove exposing a predetermined region of the first interlayer dielectric; and

patterning the exposed first interlayer dielectric to form a contact hole exposing a predetermined region of the substrate, wherein the first and second interlayer dielectric layers comprise the mold layer.

6. (Original) A method according to Claim 1 wherein the barrier layer comprises at least one material selected from the group consisting of Ti, Ta, TiN, Ti/TiN, TaN, Ta/TaN, and WN.

7. (Previously presented) A method according to Claim 1 wherein the flowable material comprises a material having an etch selectivity with respect to the mold layer.

8. (Previously presented) A method according to Claim 7 wherein the flowable material comprises a photoresist.

9. (Original) A method according to Claim 8 wherein the flowable material is removed using a developer.

10. (Original) A method according to Claim 8 wherein the flowable material is removed by an ashing process.

11. (Previously presented) A method according to Claim 7 wherein the flowable material comprises SOG (spin on glass).

12. (Previously presented) A method according to Claim 11 wherein the flowable material in the intaglio pattern is removed using either one of a phosphoric acid containing solution and a fluoric acid containing solution.

13. (Original) A method according to Claim 1 wherein the conductive layer comprises aluminum.

14. (Original) A method according to Claim 13 wherein forming the conductive layer comprises forming the aluminum layer by chemical vapor deposition (CVD) or sputtering.

15. (Original) A method according to Claim 14 wherein forming the aluminum layer further comprises:

performing a reflow process for a substrate including the deposited aluminum layer.

16. (Original) A method according to Claim 1 wherein the conductive layer comprises one of copper and tungsten.

17. (Original) A method according to Claim 1 after forming the conductive layer:

planarizing the conductive layer to expose the upper surface of the mold layer to form a metal pattern in the intaglio pattern.

18. (Original) A method according to Claim 17 wherein planarizing the conductive layer comprises planarizing using a chemical mechanical polishing (CMP) process.

19. (Previously presented) A method of forming a conductive pattern in a mold layer, the method comprising:

forming a contact hole in a first mold layer on a lower conductive pattern;

forming a first barrier layer in the contact hole and outside the contact hole on a first upper surface of an oxide layer included in the first mold layer;

forming a first flowable material on the first barrier layer;

removing the first flowable material to expose the first upper surface and to avoid removing the first flowable material from inside the contact hole;

removing the first flowable material from inside the contact hole;

forming a first conductive layer in the contact hole and on the exposed upper surface;

removing the first conductive layer to expose the first upper surface and to avoid removing the first conductive layer from inside the contact hole;

forming a second mold layer on the first mold layer;

forming a groove in the second mold layer on the contact hole;

forming a second barrier layer in the groove and outside the groove on a second upper surface of an oxide layer included in the second mold layer;

forming a second flowable material on the second barrier layer;

removing the second flowable material to expose the second upper surface and to avoid removing the second flowable material from inside the groove;

removing the second flowable material from inside the groove;

forming a second conductive layer in the groove and on the exposed second upper surface of the second mold layer, wherein the second conductive layer comes in

contact with the second barrier layer and the exposed upper surface of the second mold layer; and

removing the second conductive layer to expose the second upper surface and to avoid removing the second conductive layer from inside the groove.

20. (Previously presented) A method of forming a conductive pattern in a mold layer, the method comprising:

forming a contact hole in a mold layer on a lower conductive pattern;

forming a groove on the contact hole in the mold layer, the groove being wider than the contact hole;

forming a barrier layer in the groove and outside the groove on an upper surface of an oxide layer included in the mold layer;

forming a flowable material on the barrier layer;

removing the flowable material to expose the upper surface and to avoid removing the flowable material from inside the groove;

removing the flowable material from inside the groove;

forming a conductive layer in the groove and on the exposed upper surface of the second mold layer, wherein the conductive layer comes in contact with the barrier layer and the exposed upper surface of the mold layer; and

removing the conductive layer to expose the upper surface and to avoid removing the conductive layer from inside the groove.